

# Subject Index to Volume 9

## A

- Absorption: *see* specific subject and site
- Acidification, urinary, ATPase and (toad, turtle), C201
- Acidosis, muscle contraction, C121
- Action potentials: *see* Potentials
- Adenosine 5'-diphosphate, muscle contraction, C121
- Adenosine monophosphate, cyclic, transport, high-resistance epithelia (amphibia), C103
- Adenosine 5'-monophosphate creatine phosphate, muscle contraction, C121
- Adenosine triphosphatase: *see also* Sodium-potassium-ATPase activity, actin-activated myosin, smooth muscle contraction, arterial (swine), C222
- F<sub>0</sub>-F<sub>1</sub> proton translocating effects, urinary acidification (toad, turtle), C201
- proton, urinary acidification (toad, turtle), C201
- Adenosine triphosphate, lactic acid and, muscle contraction, C121
- Adrenalectomy, aldosterone binding, kidney, C20
- Adrenergic nerves
  - ovarian steroid effects, uterus and oviduct, C165
  - pregnancy effects, uterus and oviduct, C165
- $\alpha$ -Adrenergic receptors: *see* Receptors
- Air-blood barrier, amino acid, pulmonary absorption, C215
- Aldosterone
  - binding, cytoplasmic and nuclear receptors, kidney, C20
  - receptors: *see* Receptors
  - transport, high-resistance epithelia (amphibia), C103
- Amiloride, high-resistance epithelia (amphibia), C103
- Amino acid
  - absorption, pulmonary, C215
  - carrier transport, C215
- 1-Aminocyclopentanecarboxylic acid, absorption, pulmonary, C215
- Amylase, release, monensin effects, parotid acini, C189
- Arteries, smooth muscle contraction, myosin light chain phosphorylation associated (swine), C222

## B

- Bicarbonate
  - extracellular, pH regulation, muscle fibers (barnacle), C80
  - transport, muscle fibers (barnacle), C80
- Bladder: *see* Urinary bladder
- Bone, cell isolation, enzymatic, C234

## C

- Caffeine, calcium mobilization, smooth muscle, C239
- Calcium
  - amylase release and, parotid acini, C189
  - dependence, contraction, smooth muscle, arterial (swine), C222

- efflux, smooth muscle, C239
- extracellular concentration, tetanus tension (frog), C193
- fluxes, myometrium membrane vesicles, C175
- incorporation, smooth muscle, C248
- insulin release, islet  $\beta$ -cells, C64
- intracellular movements, skinned muscle fibers, C1
- membrane potentials, islet  $\beta$ -cells, C64
- norepinephrine and methylxanthine effects, smooth muscle, C239
- transport, cyclic GMP and, salt gland (duck), C207
- Calcium ions
  - mobilization, norepinephrine and methylxanthines, smooth muscle, C239
  - uptake, potassium-stimulated, islet subcellular particles, C35
- Calvaria, cell isolation, enzymatic, C234
- Cardiac muscle: *see* Muscle, heart
- Cells: *see also* specific type and site
  - cloned, properties, kidney, C106
  - culture
    - glucose transport, transepithelial (pig), C92
    - ion transport, prolactin effects, mammary epithelium, C110
    - transepithelial transport, C92
  - differentiation, mammary epithelium, C110
  - enzymatic isolation, bone, C234
- Centrifugation, isopycnic, cell isolation, bone, C234
- Chloride
  - activity, intracellular, ouabain effects, papillary muscle, C183
  - equilibrium potential, ouabain effects, papillary muscle, C183
- 7-Chloro-4-nitrobenzo-2-oxa-1,3-diazole, urinary acidification (toad, turtle), C201
- Cholinergic activation, cyclic GMP and, sodium-potassium pump, salt gland (duck), C207
- Collagen, floating gels, mammary epithelium, prolactin effects on ion transport, C110
- Collagenase, bacterial, cytotoxic enzymes of, cell isolation, bone, C234
- Contraction
  - muscular: *see* Muscle
- Cotransport system, epithelial cell line, kidney, C106
- Coupling
  - excitation-contraction
    - calcium-induced inhibition, skeletal muscle (frog), C193
    - myosin light chain phosphorylation, smooth muscle, arterial (swine), C222
    - skinned muscle fibers, C1
    - sodium-calcium exchange, myometrium membrane vesicles, C175
- Current, short-circuit, glucose transport, transepithelial cell culture (pig), C92
- Cyclic AMP: *see* Adenosine monophosphate, cyclic

- Cyclic GMP: *see* Guanosine monophosphate, cyclic
- Cycloneucine, absorption, pulmonary, C215
- Cytoplasmic distribution, chloride, ouabain effects, papillary muscle, C183
- Cytoplasmic receptors: *see* Receptors
- Cytotoxic enzyme, cell isolation, bone, C234

## D

- 20,25-Diazacholesterol, membrane potentials in myotonia (goat, rat), C56
- N,N'-Dicyclohexylcarbodiimide, urinary acidification (toad, turtle), C201
- 5,5-Dimethylxazolidine
  - 2,4-dione, membrane permeability, muscle (barnacle), C73
- Dipole theory, electrograms, ventricular, C148

## E

- Electrical activity, glucose-induced, pancreatic  $\beta$ -cell, C127
- Electrical resistance, hormone effects, transport, cultured epithelia (amphibia), C103
- Electrocardiogram, nonspatial determinants, ventricular, C148
- Electrogenic extrusion, sodium, ventricular muscle, C28
- Electrogram, nonspatial determinants, ventricular, C748
- Electrophysiological studies: *see also* specific subject and site
  - cellular, electrograms, ventricular, C148
  - glucose effects, pancreatic  $\beta$ -cells, C127
- Enzymes: *see also* specific enzyme
  - cell isolation, bone, C234
- Epithelial cells, kidney: *see* Kidney cells
- Epithelial monolayers, cultured, occluding junctions, C96
- Epithelium: *see also* specific subject and site
  - transport, hormone effects, high electrical resistance (amphibia), C103
- N-Ethoxycarboxyl-2-ethoxy-1,2-ethoxyl-1,2-dihydroquinoline, urinary acidification (toad, turtle), C201
- Excitation-contraction coupling: *see* Coupling

## F

- Fatigue, lactic acid and adenosine triphosphate effects, muscle contraction, C121
- F<sub>0</sub>-F<sub>1</sub> proton-translocating ATPase: *see* Adenosine triphosphatase
- Fibers, Purkinje, potassium activity, C39
- Freeze fracture, tetraethylammonium effects, pancreatic  $\beta$ -cell gap junctions, C116

## G

- Gap junctions: *see* Junctions
- Glucocorticoids, aldosterone binding, kidney, C20

Glucose  
electrical activity, pancreatic  $\beta$ -cell, C127  
transepithelial transport, cell (pig), C92  
Glycosides, cardiac, ouabain effects, C183  
Growth, regulation, kidney epithelial cell line, C106  
Guanosine monophosphate, cyclic, cholinergic activation, sodium-potassium pump, salt gland (duck), C207

## H

Heart, potassium activity, stimulation frequency effects, C39  
Heart cells, volume, stimulation frequency effects, C39  
Heart ventricles  
electrograms, nonspatial determinants, C148  
resting potential  
electrogenic component, C28  
muscular, C28  
Hexose, transport, cell culture, transepithelial (pig), C92  
Hormones: *see also* specific hormone effects, high resistance epithelia in culture (amphibia), C103  
Hydrogen ions, concentration, muscle contraction, C121  
Hyperglycemia, calcium ion uptake, pancreatic islets, C35  
Hypoxia, electrograms, ventricular, C148

## I

Inorganic phosphate, muscle contraction, C121  
Insulin  
release  
calcium effects, islet  $\beta$ -cells, C64  
tetraethylammonium effects, pancreatic  $\beta$ -cells, C116  
Intestines, slow waves, propagation, longitudinal muscle, C135  
Intracellular recording, slow waves, intestinal, C135  
Iodoacetic acid, electrograms, ventricular, C148  
Ionic conductivities, electrograms, ventricular, C148  
Ions  
extracellular concentrations, membrane potentials in myotonia (goat, rat), C56  
transport, prolactin effects, mammary epithelium, C110  
Islet cells: *see* Pancreatic islet cells  
Islets of Langerhans: *see* Pancreatic islet cells  
Isopycnic centrifugation: *see* Centrifugation

## J

Junctions  
gap, tetraethylammonium effects, pancreatic  $\beta$ -cells, C116  
occluding, cultured epithelial monolayers, C96

## K

Kidney, aldosterone binding, cytoplasmic and nuclear receptors, C20  
Kidney cells  
epithelial MDCK, growth and differentiation, C106

line LLC-PK<sub>1</sub>, glucose transport, transepithelial (pig), C92  
line MDCK, occluding junctions, C96  
Kidney tubules, regeneration, epithelial cell line, C106

## L

Lactic acid, adenosine triphosphate decrease and, muscle contraction, C121  
Langerhans, islets of: *see* Pancreatic islet cells  
Lung, permeability: *see* Permeability

## M

Mammary epithelium, ion transport, prolactin effects, C110  
Membrane  
permeability: *see* Permeability  
plasma, enriched membrane vesicles, sodium-calcium exchange, myometrium, C175  
potentials: *see* Potentials  
transport, sodium-calcium, myometrium membrane vesicles, C175  
vesicles, plasma membrane enriched, sodium-calcium exchange, myometrium, C175  
Methylxanthines, calcium ion mobilization, smooth muscle, C239  
Microelectrodes, electrograms, ventricular, C148  
Milk ions, transport, prolactin effects, mammary epithelium, C110  
Mineralocorticoid receptors: *see* Receptors  
Models, muscle fibers, pH regulation (barnacle), C80  
Monensin, amylase release, parotid acini, C189  
Morphogenesis, epithelial cell line, kidney, C106  
Muscle  
contraction  
adenosine triphosphate decrease effects, C121  
lactic acid accumulation effects, C121  
longitudinal, slow wave propagation, C135  
Muscle, heart  
chloride activity, intracellular, ouabain effects, C183  
potassium activity, ventricular, C39  
resting potential, electrogenic component, ventricular, C28  
Muscle, skeletal  
activation, studies on skinned fibers, vertebrate, C1  
contraction, lactic acid and adenosine triphosphate effects, C121  
membrane potentials in myotonia (goat, rat), C56  
tetanus tension inhibition, extracellular calcium concentration (frog), C193  
Muscle, smooth  
adrenergic neurons, ovarian steroid and pregnancy effects, C165  
arterial, norepinephrine effects, calcium mobilization, C239  
calcium ion mobilization, norepinephrine and methylxanthines, C239  
contraction, myosin light chain phosphorylation, arterial (swine), C222  
slow wave propagation, intestinal, C135  
sodium-calcium exchange, myometrium

membrane vesicles, C175  
subcellular fractions, calcium incorporation, C248  
Muscle fibers  
acid extrusion (barnacle), C80  
5,5-dimethylloxazolidine-2,4-dione, membrane permeability (barnacle), C73  
pH regulation, sodium and bicarbonate effects (barnacle), C80  
skinned, activation, C1  
Myometrium, sodium-calcium exchange, plasma membrane enriched membrane vesicles, C175  
Myosin  
light chain kinase, contraction, arterial smooth muscle (swine), C222  
light chain phosphorylation, contraction, arterial smooth muscle (swine), C222  
Myotonia, membrane potentials (goat, rat), C56

## N

Nasal gland, cyclic GMP and, cholinergic activation, sodium-potassium pump (duck), C207  
*p*-Nitrophenylphosphatase, ouabain-sensitive, cyclic GMP and, salt gland (duck), C207  
Norepinephrine  
calcium ion mobilization, smooth muscle, C239  
metabolism, adrenergic nerves, uterus and oviduct, C165  
Nuclear receptors: *see* Receptors

## O

Obesity, calcium ion uptake, pancreatic islets, C35  
Oligomycin, urinary acidification (toad, turtle), C201  
Ouabain  
glucose-induced electrical activity, pancreatic  $\beta$ -cells, C127  
intracellular effects, chloride activity, papillary muscle, C183  
Oviduct  
ovarian steroid effects, adrenergic nerves, C165  
pregnancy effects, adrenergic nerves, C165

## P

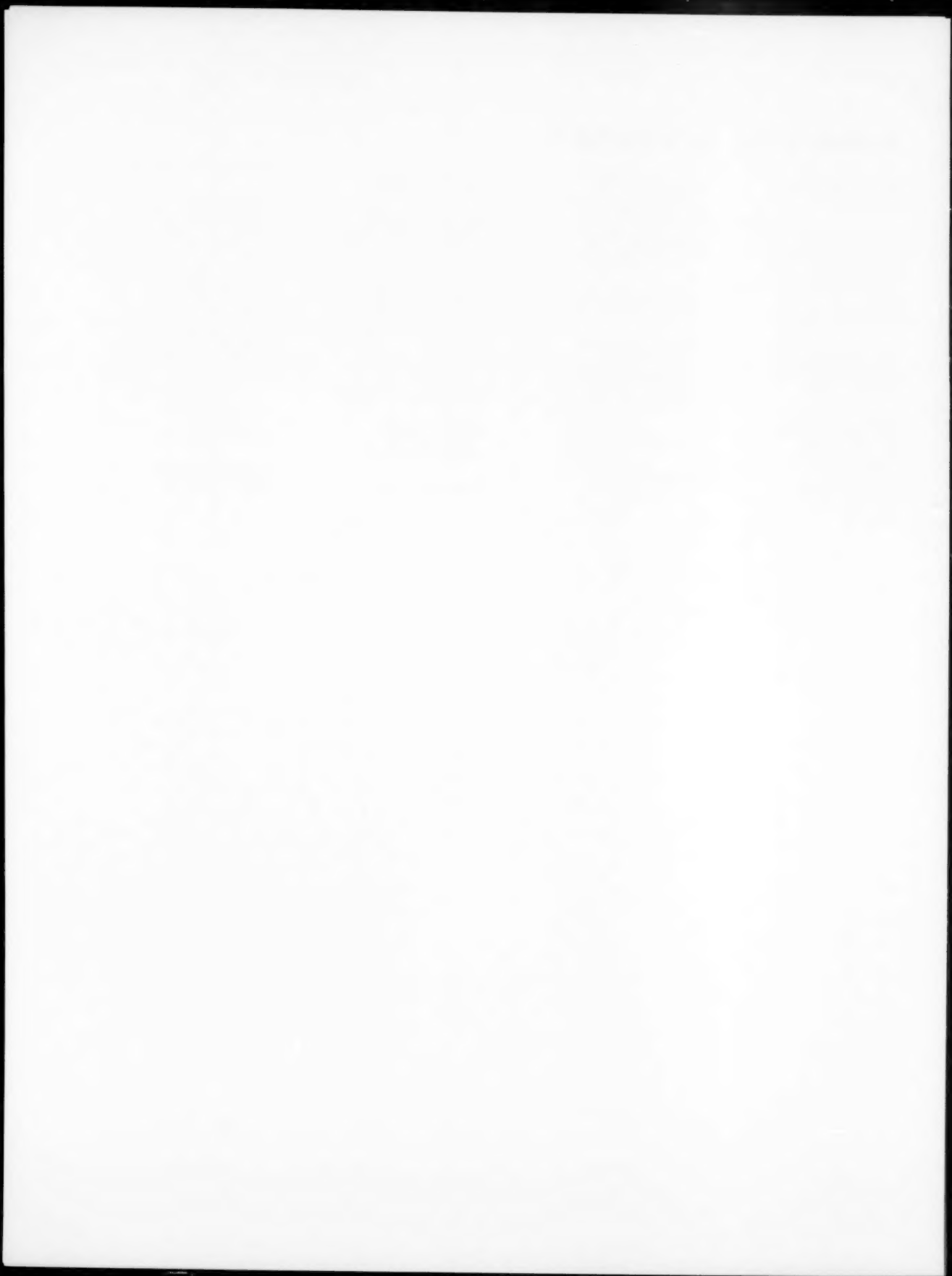
Pancreas, perfused, calcium effects, C64  
Pancreatic  $\beta$ -cells  
calcium ion uptake, potassium-stimulated, C35  
calcium-magnesium competition, C64  
electrical activity  
calcium effects, C64  
glucose-induced, C127  
gap junctions, tetraethylammonium modification, C116  
insulin: *see* Insulin  
membrane potentials, calcium effects, islet  $\beta$ -cells, C64  
Pancreatic islet cells, gap junctions, tetraethylammonium modification, C116  
Parotid acini, amylase release, monensin effects, C189  
Permeability  
lung, amino acids, C215  
membrane

- 5,5-dimethylloxazolidine-2,4-dione, muscle (barnacle), C73  
 myotonia (goat, rat), C56  
 potassium ions, calcium-activated, pancreatic  $\beta$ -cells, C64  
 respiratory tract, amino acid, C215
- pH  
 intracellular  
 5,5-dimethylloxazolidine-2,4-dione, membrane permeability, muscle (barnacle), C73  
 regulation, muscle fibers (barnacle), C80  
 regulation  
 extracellular sodium and bicarbonate effects (barnacle), C80  
 muscle fibers (barnacle), C80  
 Phlorizin, glucose transport, transepithelial cell culture (pig), C92  
 Phosphorylation, myosin light chain, contraction, arterial smooth muscle (swine), C222  
 Potassium  
 activity, stimulation frequency effects, heart, C39  
 conductance blocker, pancreatic  $\beta$ -cells, C116  
 resting potential, ventricular muscle, C28  
 Potassium ions  
 calcium ion uptake, pancreatic islets, C35  
 permeability, calcium-activated, pancreatic  $\beta$ -cells, C64  
 Potentials  
 action  
 electrograms, ventricular, C148  
 muscle, calcium-induced inhibition (frog), C193  
 membrane  
 calcium effects, islet  $\beta$ -cells, C64  
 electrograms, ventricular, C148  
 extracellular ionic concentrations in myotonia (goat, rat), C56  
 resting, electrogenic component, ventricular muscle, C28  
 Pregnancy, ovarian steroids and, adrenergic nerves, uterus and oviduct, C165  
 Prolactin, ion transport, mammary epithelium, C110  
 Propagation, intestinal slow waves, C135  
 Proteins, smooth muscle contractile, myosin light chain phosphorylation, arterial (swine), C222  
 Protons  
 ATPase: *see* Adenosine triphosphatase channel, ATPase and, urinary acidification (toad, turtle), C201  
 Pulmonary absorption, amino acids, C215  
 Pump  
 sodium, glucose-induced electrical activity, pancreatic  $\beta$ -cells, C127  
 sodium-potassium, cyclic GMP and, cholinergic activation, salt gland (duck), C207  
 Purkinje fibers, potassium activity, C39
- Q**  
 Quinine, glucose-induced electrical activity, pancreatic  $\beta$ -cells, C127
- R**  
 Radionuclide studies: *see* specific subject and site  
 Receptors  
 $\alpha$ -adrenergic, norepinephrine and methylxanthines effects, smooth muscle, C239  
 aldosterone, kidney, C20  
 cytoplasmic, aldosterone binding, kidney, C20  
 mineralcorticoid, aldosterone binding, kidney, C20  
 nuclear, aldosterone binding, kidney, C20  
 Respiratory permeability: *see* Permeability
- S**  
 Salt gland, cyclic GMP and, cholinergic activation, sodium-potassium pump (duck), C207  
 Short-circuit current: *see* Current  
 Skeletal muscle: *see* Muscle, skeletal  
 Slow-waves, intestinal, propagation, longitudinal muscle, C135  
 Sodium  
 active transport, prolactin effects, mammary epithelium, C110  
 amylase release and, parotid acini, C189  
 dependent, glucose transport, transepithelial (pig), C92  
 electrogenic extrusion, ventricular muscle, C28  
 extracellular, pH regulation, muscle fibers (barnacle), C80  
 transport  
 cyclic GMP and, salt gland (duck), C207  
 high-resistance epithelia (amphibia), C103  
 Sodium-calcium exchange, myometrium membrane vesicles, plasma membrane enriched, C175  
 Sodium carbonate, transport, muscle fibers (barnacle), C80  
 Sodium-hydrogen, antiport system, epithelial cell line, kidney, C106  
 Sodium ions, calcium ion uptake, pancreatic islets, C35  
 Sodium-potassium-ATPase, cholinergic activation, cyclic GMP and, salt gland (duck), C207  
 Sodium-potassium exchange, resting potential, ventricular muscle, C28  
 Sodium-potassium pump: *see* Pump
- Sodium pump: *see* Pump  
 Species differences  
 membrane potential in myotonia (goat, rat), C56  
 urinary acidification, ATPase and (toad, turtle), C201  
 Steroid-norepinephrine interactions, adrenergic nerves, uterus and oviduct, C165  
 Steroids, ovarian, adrenergic nerves, uterus and oviduct, C165  
 ST-segment, mapping, electrograms, ventricular, C148
- T**  
 Tetanus tension, calcium ion-induced inhibition, extracellular (frog), C193  
 Tetraethylammonium  
 gap junction modification, pancreatic  $\beta$ -cells, C116  
 glucose-induced electrical activity, pancreatic  $\beta$ -cells, C127  
 Tetranitromethane, urinary acidification (toad, turtle), C201  
 Tetrodotoxin, glucose-induced electrical activity, pancreatic  $\beta$ -cells, C127  
 Transepithelial transport  
 epithelial cell properties, kidney, C106  
 glucose, cell culture, C92  
 hormone effects, high resistance (amphibia), C103  
 ions, prolactin effects, mammary, C110  
 occluding junctions, kidney, C96  
 Transport: *see* specific subject and site  
 T-tubular conduction, tetanus tension, extracellular calcium concentration skeletal muscle, (frog), C193  
 Tumorigenicity, epithelial cell line, kidney, C106
- U**  
 Urinary acidification: *see* Acidification  
 Urinary bladder, acidification, ATPase and (toad, turtle), C201  
 Uterus  
 ovarian steroid effects, adrenergic nerves, C165  
 pregnancy effects, adrenergic nerves, C165
- V**  
 Vasopressin, transport, high-resistance epithelia (amphibia), C103  
 Ventricles: *see* Heart ventricles  
 Veratridine, electrical activity, pancreatic  $\beta$ -cell, C127  
 Voltage, transmembrane, electrograms, ventricular, C148  
 Volume recording, slow waves, intestinal, C135



## Author Index to Volume 9

- Aksoy, M. O., C222  
 Arnsdorf, M. F., C148  
 Atwater, L., C64
- Bisbee, C. A., C110  
 Bonvalet, J.-P., C20  
 Boron, W. F., C80  
 Bortoff, A., C135  
 Brand, J. S., C234  
 Browning, D. J., C39  
 Bryant, S. H., C56
- Caille, J.-P., C28, C183  
 Cereijido, M., C96  
 Cushing, J., C234
- Daniel, E. E., C175  
 DeCoursey, T. E., C56  
 Deth, R. C., C239  
 Driska, S. P., C222
- Edström, L., C121
- Fanestil, D. D., C201  
 Farman, N., C20  
 Farnham, C. J., C189  
 Farnham, W., C189  
 Fishman, A. P., C161  
 Frankel, B. J., C64  
 Friedman, J., C189
- Grodsky, G. M., C64  
 Grover, A. K., C175
- Handler, J. S., C103  
 Hefley, T., C234  
 Holland, R. P., C148  
 Howell, J. N., C193  
 Hultman, E., C121
- Johnson, J. P., C103
- Keifer, D. W., C73  
 Kwan, C. Y., C175
- Lin, Y. J., C215  
 Lynch, C. J., C239
- Marshall, J. M., C165  
 Martinez-Palomo, A., C96  
 McCormick, W. C., C80  
 Meda, P., C116  
 Meza, I., C96  
 Michaels, D., C135  
 Misfeldt, D. S., C92  
 Mistretta, P., C135  
 Murphy, R. A., C222
- Nguyen-Thi, A., C28
- Owenburg, K. M., C56
- Pace, C. S., C127  
 Park, C. S., C201  
 Perkins, F. M., C103
- Roos, A., C73, C80
- Ruiz-Ceretti, E., C28, C183
- Sahlin, K., C121  
 Saier, M. H., Jr., C106  
 Sanders, M. J., C92  
 Schanker, L. S., C215  
 Schanne, O. F., C28, C183  
 Sehlin, J., C35  
 Sen, A. K., C207  
 Sheppard, M. S., C116  
 Sjöholm, H., C121  
 Snowdowne, K. W., C193  
 Stephenson, E. W., C1  
 Stewart, D. J., C207  
 Strauss, H. C., C39
- Tarvin, J. T., C127
- Vandewalle, A., C20
- Watson, E. L., C189  
 Wright, E. M., C91



# American Journal of Physiology: Cell Physiology

VOLUME 9, January, March, May 1981

Editor: P. HOROWICZ

---

**Associate Editors:**

P. DE WEER  
A. L. FINN

H. A. FOZZARD  
F. J. JULIAN  
C. F. STEVENS

J. S. WILLIS  
S. WINEGRAD

---

***Publications Committee of  
the American Physiological  
Society***

A. P. FISHMAN, *Chairman*  
R. M. BERNE  
H. E. MORGAN

S. R. GEIGER  
*Publications Manager and  
Executive Editor*

B. B. RAUNER  
*Production Manager*

W. A. SONNENBERG  
*Business Manager*

M. P. ROYAL  
*Copy Editor*

---

*Published bimonthly by*  
THE AMERICAN PHYSIOLOGICAL SOCIETY  
9650 Rockville Pike, Bethesda, Md. 20014

Copyright © 1981 by the American Physiological Society. Printed in the United States of America by Waverly Press, Inc., Baltimore, MD 21202. The code at the bottom of the first page of an article indicates the copyright owner's consent that copies of an article may be made beyond that permitted by sections 107 and 108 of the U.S. Copyright Law—unless the copies are for general distribution, for advertising, for creating new works, or for resale—provided the per-copy fee is paid through the Copyright Clearance Center, Inc., 21 Congress St., Salem, MA 01970.



## Guest Referee Editors

*The Publications Committee of the American Physiological Society gratefully acknowledges the services of the following guest referee editors who assisted the Editorial Board in the reviews of manuscripts.*

W. McD. Armstrong  
M. Arnsdorf  
S. Banerjee  
C. Baumgarten  
T. Begenisich  
P. Bianchi  
G. D. Bittner  
J. J. Blum  
W. F. Boron  
R. C. Boucher  
R. A. Bradshaw  
P. M. Cala  
C. Caputo  
M. Cereijido  
R. G. Coffey  
I. S. Cohen  
R. J. Connett  
J. A. Connor  
E. E. Daniel  
R. Davies  
D. R. DiBona  
R. Elizondo  
A. G. Engel  
J. D. Etlinger  
A. Fabiato  
R. S. Fisher  
L. E. Ford

R. Frizzell  
W. R. Gibbons  
A. M. Gordon  
H. Green  
R. B. Gunn  
J. Gwynne  
S. Hagiwara  
J. A. Hall  
K. Harmsmeyer  
S. J. Hershey  
J. O. Holloszy  
E. Homsher  
C. R. Honig  
O. Hutter  
A. Jones  
R. S. Kass  
G. Kimmich  
R. K. Kinne  
P. Knauf  
F. M. Kregenow  
M. J. Kushmerick  
M. Lang  
P. C. Laris  
P. G. LeFevre  
H. C. Lüttgau  
D. Macchia  
T. E. Machen

D. A. Machsen  
L. J. Mandel  
J. Mangos  
J. R. Martinez  
R. Meiss  
L. Mela  
G. Meschia  
L. Miller  
R. K. Miller  
L. E. Moore  
H. Morgan  
R. T. Moxley III  
R. Murphy  
J. Neely  
D. Nicholls  
R. J. Paul  
F. J. Pearce  
C. Peracchia  
J. W. Pledger  
G. Pollack  
J. Potter  
D. Prockup  
E. M. Renkin  
E. Rios  
A. Roos  
N. Rubenstein  
J. M. Russell

S. A. Sarkar  
A. Scarpa  
M. F. Schneider  
D. Schotland  
R. Scow  
M. Seigman  
J. A. Shafer  
E. M. Shooter  
S. H. Snyder  
A. Somlyo  
B. C. Spalding  
N. C. Staub  
P. Steinmetz  
F. Sterling  
C. Van Breemen  
W. G. Van der Kloot  
R. A. Venosa  
G. A. Vidaver  
M. Villereal  
A. Weber  
M. Weisfeldt  
D. N. Woodbury  
J. W. Woodbury  
E. M. Wright  
K. L. Zierler  
R. Zucker



# American Journal of Physiology: Cell Physiology

No. 1. JANUARY 1981

## INVITED REVIEW

Activation of fast skeletal muscle: contributions of studies on skinned fibers <i>E. W. Stephenson</i>	C1
Binding of aldosterone to cytoplasmic and nuclear receptors of the rabbit kidney <i>N. Farman, A. Vandewalle, and J.-P. Bonvalet</i>	C20
An electrogenic component of resting potential in rabbit ventricular muscle <i>E. Ruiz-Ceretti, A. Nguyen-Thi, O. F. Schanne, and J.-P. Caille</i>	C28
Potassium-stimulated $^{45}\text{Ca}^{2+}$ uptake by subcellular particles of pancreatic $\beta$ -cells <i>J. Sehlin</i>	C35
Effects of stimulation frequency on potassium activity and cell volume in cardiac tissue <i>D. J. Browning and H. C. Strauss</i>	C39
Dependence of membrane potential on extracellular ionic concentrations in myotonic goats and rats <i>T. E. DeCoursey, S. H. Bryant, and K. M. Owenburg</i>	C56
Calcium affects insulin release and membrane potential in islet $\beta$ -cells <i>B. J. Frankel, I. Atwater, and G. M. Grodsky</i>	C64
Membrane permeability to the molecular and ionic forms of DMO in barnacle muscle <i>D. W. Keifer and A. Roos</i>	C73
pH regulation in barnacle muscle fibers: dependence on extracellular sodium and bicarbonate <i>W. F. Boron, W. C. McCormick, and A. Roos</i>	C80

No. 2. MARCH 1981

## TRANSEPITHELIAL TRANSPORT IN CELL CULTURE

Introduction <i>E. M. Wright</i>	C91
Transepithelial glucose transport in cell culture <i>D. S. Misfeldt and M. J. Sanders</i>	C92
Occluding junctions in cultured epithelial monolayers <i>M. Cerejido, I. Meza, and A. Martinez-Palomo</i>	C96
Hormone effects on transport in cultured epithelia with high electrical resistance <i>J. S. Handler, F. M. Perkins, and J. P. Johnson</i>	C103
Growth and differentiated properties of a kidney epithelial cell line (MDCK) <i>M. H. Saier, Jr.</i>	C106
Prolactin effects on ion transport across cultured mouse mammary epithelium <i>C. A. Bisbee</i>	C110
Tetraethylammonium modifies gap junctions between pancreatic $\beta$ -cells <i>M. S. Sheppard and P. Meda</i>	C116
Effects of lactic acid accumulation and ATP decrease on muscle tension and relaxation <i>K. Sahlin, L. Edström, H. Sjöholm, and E. Hultman</i>	C121
Glucose-induced electrical activity in the pancreatic $\beta$ -cell: effect of veratridine <i>J. T. Tarvin and C. S. Pace</i>	C127
Dominance of longitudinal muscle in propagation of intestinal slow waves <i>A. Bortoff, D. Michaels, and P. Mistretta</i>	C135
Nonspatial determinants of electrograms in guinea pig ventricle <i>R. P. Holland and M. F. Arnsdorf</i>	C148

Hail and farewell <i>A. P. Fishman</i>	C161
---	------

---

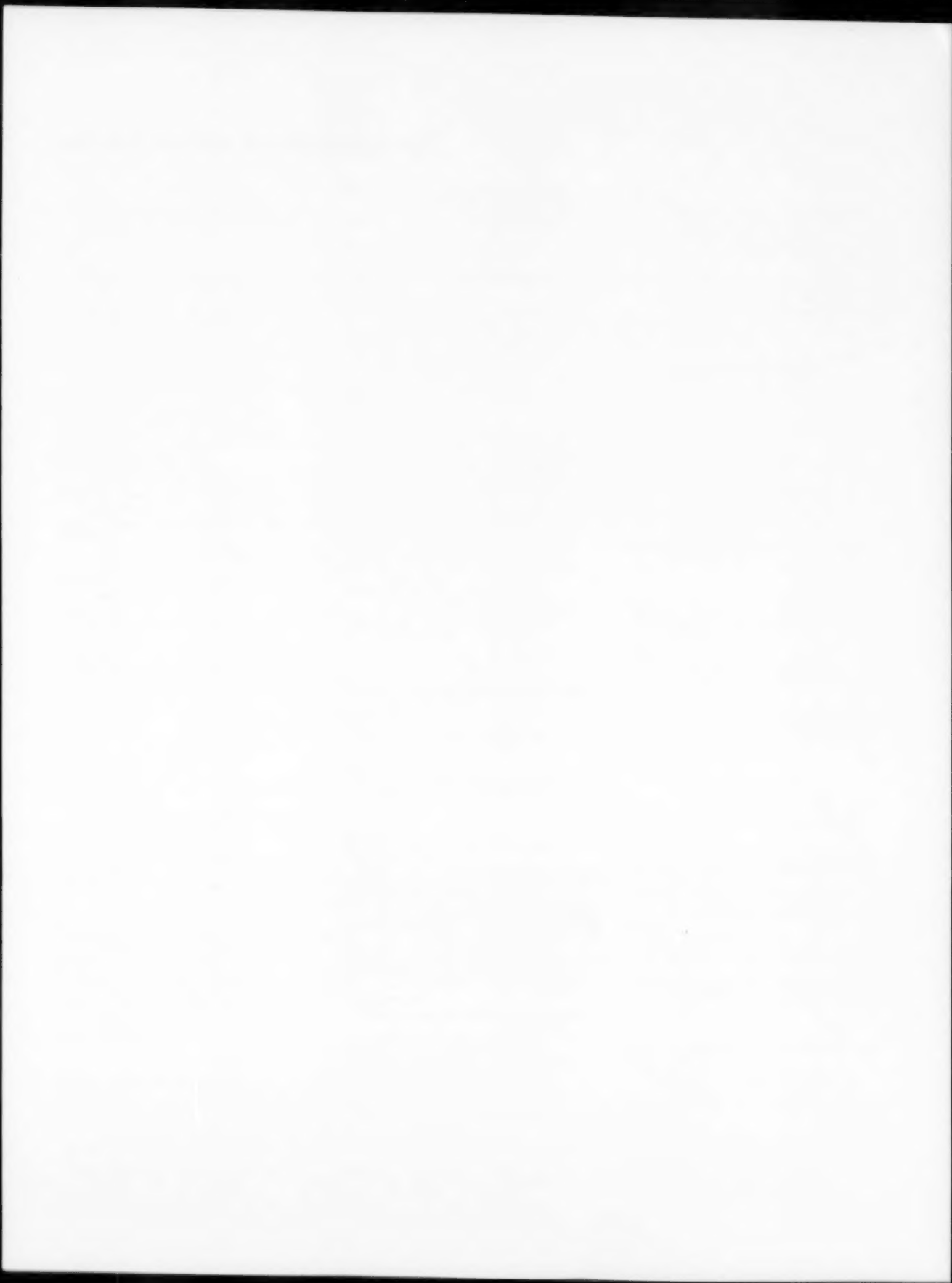
**INVITED REVIEW**

Effects of ovarian steroids and pregnancy on adrenergic nerves of uterus and oviduct <i>J. M. Marshall</i>	C165
<hr/>	
Na-Ca exchange in rat myometrium membrane vesicles highly enriched in plasma membranes <i>A. K. Grover, C. Y. Kwan, and E. E. Daniel</i>	C175
Intracellular chloride activity in rabbit papillary muscle: effect of ouabain <i>J.-P. Caille, E. Ruiz-Ceretti, and O. F. Schanne</i>	C183
Effects of monensin on amylase release from mouse parotid acini <i>E. L. Watson, C. J. Farnham, J. Friedman, and W. Farnham</i>	C189
Inhibition of tetanus tension by elevated extracellular calcium concentration <i>J. N. Howell and K. W. Snowdowne</i>	C193
Effects of inhibitors of $F_0F_1$ proton-translocating ATPase on urinary acidification <i>D. D. Fanestil and C. S. Park</i>	C201
Role of cyclic GMP in cholinergic activation of Na-K pump in duck salt gland <i>D. J. Stewart and A. K. Sen</i>	C207
Pulmonary absorption of amino acids in the rat: evidence of carrier transport <i>Y. J. Lin and L. S. Schanker</i>	C215
Myosin light chain phosphorylation associated with contraction in arterial smooth muscle <i>S. P. Driska, M. O. Aksoy, and R. A. Murphy</i>	C222
Enzymatic isolation of cells from bone: cytotoxic enzymes of bacterial collagenase <i>T. Hefley, J. Cushing, and J. S. Brand</i>	C234
Mobilization of a common source of smooth muscle $Ca^{2+}$ by norepinephrine and methylxanthines <i>R. C. Deth and C. J. Lynch</i>	C239

---

**LETTERS TO THE EDITOR**

Calcium incorporation by smooth muscle subcellular fractions <i>P. Kutsky and F. R. Goodman; A. K. Grover</i>	C248
--	------





# Subject Index to Volume 10

## A

- Acetyl glyceryl ether phosphorylcholine, smooth muscle contraction, ileum, C130
- Acid
  - weak
    - glucose-induced electrical activity,  $\beta$ -cells, C264
    - muscle fibers and (barnacle), C193
- Action potentials: *see* Potentials
- Adenosine monophosphate, cyclic calcium and, submandibular mucin secretion, C76
- transport properties, kidney epithelia (toad), C154
- Adenosine triphosphate, muscle fiber fatigue, caffeine and (frog), C160
- Adipocytes, epithelial cells and, metabolic cooperativity, C204
- $\beta$ -Adrenergic agonist, insulin hyperpolarization, muscle, C145
- Adrenergic mechanisms, calcium, eccrine sweat secretion (monkey), C113
- Airway, mechanics, smooth muscle, C42
- Aldosterone amiloride, transport properties, kidney epithelia (toad), C154
- Amiloride, isoproterenol-induced changes, glands, skin (frog), C250
- Amino acids
  - incorporation, cells, tracheal epithelium, C184
  - transport
    - calcium deprivation effects, hepatocytes, C3
    - erythrocytes (chicken), C233
  - uptake, placenta, maternal and fetal, C106
- Ammonium, lithium and, sodium-hydrogen exchanger, renal microvillus membrane, C220
- Anaphylaxis, smooth muscle contraction, ileum, C130
- Anion, transport, weak acid effects, muscle fibers (barnacle), C193
- Aorta, mechanism of activation, prostaglandin  $H_2$  analogue U-44069, C243
- ATPase: *see* Sodium-potassium-ATPase

## B

- Bicarbonate, transport, sodium-hydrogen exchanger, kidney, C220
- Bladder: *see* Urinary bladder
- Breeding, selective, leucine transport, erythrocytes (chicken), C233
- Brown fat, thermogenesis, thyroxine effects, C134
- By the numbers, C91

## C

- Caffeine, muscle fiber fatigue and (frog), C160
- Calcium
  - adenosine monophosphate, cyclic and, submandibular mucin secretion, C76
  - deprivation, hepatocytes, C3
  - eccrine sweat secretion and (monkey), C113

- Calcium ions, release, prostaglandin  $H_2$  analogue U-44069 and, aorta, C243
- Calcium spike, pancreatic  $\beta$ -cell activity, C59
- Calorigenesis, thyroxine, brown fat mitochondria, C134
- Camp: *see* Adenosine monophosphate, cyclic
- Catalytic subunit, sodium-potassium-ATPase, HeLa cells, C173
- Cations, divalent, pancreatic  $\beta$ -cells, C59
- Caudofemoralis muscle, insulin hyperpolarization, ouabain-inhibitable process, C145
- Cells: *see* specific subject and site
- Chloride
  - intracellular activity
    - ion-selective microelectrodes, C258
    - ventricular muscle (mammal), C121
- Cholinergic mechanisms, calcium, eccrine sweat secretion (monkey), C113
- Cold, adaptation, thyroxine effects, C134
- Coupling, excitation-contraction, caffeine and, muscle fibers (frog), C160
- Creatine kinase, enzyme release, skeletal muscle (frog), C98
- Current, short-circuit, gland changes, skin (frog), C250
- Cyclic adenosine monophosphate: *see* Adenosine monophosphate, cyclic
- Cytochrome c, turnover, red skeletal muscle, C140

## D

- D-600, prostaglandin  $H_2$  analogue U-44069 and, aorta, C243
- Denervation
  - heart, growth factor binding, C215
  - muscle properties and, C150
- Detraining: *see* Exercise
- Dimethylxazolidinedione, pH regulation and, muscle fibers (barnacle), C193

## E

- Eccrine sweat gland: *see* Sweat gland
- Electrical activity
  - charge carriers, pancreatic  $\beta$ -cells, C59
  - glucose-induced, pancreatic  $\beta$ -cells, C264
- Electrodes, ion-selective, chloride activity, ventricular muscle (mammal), C121
- Electron microscopy, calcium deprivation effects, hepatocytes, C3
- Enzymes: *see* specific enzyme
- Epinephrine, treatment, adaptive responses, C55
- Epithelial cells
  - adipocytes and, metabolic cooperativity, C204
  - tracheal, ion content, C184
- Epithelium: *see* specific subject and site
- Erythroblastic leukemic cells, serine requirements, C167
- Erythrocytes
  - leucine transport activity, breeding for (chicken), C233
  - sugar transport, sulfhydryl group effects (goose), C33
- Excitation-contraction coupling: *see* Coupling

## Exercise

- detraining, cytochrome c and myoglobin turnover, skeletal muscle, C140
- glucose uptake, skeletal muscle, C200
- work, caffeine and, muscle fibers (frog), C160

## F

- Fatigue, muscle fibers, caffeine and (frog), C160
- Fat pads, mammary, metabolic cooperativity, C204
- Fetus: *see also* Placenta; Pregnancy amino acid uptake, placenta, C106
- Force-velocity relations, muscle: *see* Muscle, smooth
- Fractionation, sodium-potassium-ATPase, HeLa cells, C173

## G

- GDP: *see* Guanosine diphosphate
- Glands, isoproterenol-induced changes, skin (frog), C250
- Glucose
  - blood, epinephrine effects, C55
  - electrical activity, pancreatic  $\beta$ -cells, C264
  - transport, erythrocytes (chicken), C233
  - uptake, exercise, skeletal muscle, C200
- Glucose 6-phosphate, muscle fiber fatigue, caffeine and (frog), C160
- Glycogen
  - adipocytes, epithelial cells and, metabolic cooperativity, C204
  - liver, epinephrine treatment effects, C55
  - muscle, epinephrine treatment effects, C55
  - synthesis, exercise, skeletal muscle, C200
- Glycolysis, muscle fiber fatigue, caffeine and (frog), C160
- Granules, stimulus-induced vacuoles, tracheal submucosal glands, C18
- Growth
  - factor, nerves, heart, C215
  - stretch-induced, wing muscles (chicken), C93
- Guanosine diphosphate, binding, brown fat mitochondria, thyroxine effects, C134

## H

- Heart, growth factor binding, nerves, C215
- Heart ventricles
  - chloride activity, papillary muscle (mammal), C121
  - ion-selective microelectrodes, chloride, C258
- HeLa cells, sodium-potassium-ATPase turnover, C173
- Hepatocytes
  - calcium deprivation effects, C3
  - transmembrane potential, monolayer

- Hepatocytes (*continued*)  
 culture, C209  
 Hindlimb, perfused, glucose uptake,  
 exercise, C200  
 Hyperpolarization, insulin-induced, muscle,  
 C145  
 Hypertrophy, cardiac, epinephrine  
 treatment effects, C55

## I

- Ileum, smooth muscle contraction, acetyl  
 glyceryl ether phosphorylcholine,  
 C130  
 Innervation, sympathetic, growth factor  
 binding, heart, C215  
 Insulin  
 binding, serine effects, C167  
 epinephrine treatment effects, C55  
 glucose uptake and, exercise, skeletal  
 muscle, C200  
 hyperpolarization, muscle, C145  
 receptors: *see* Receptors  
 Internalization, sodium-potassium-ATPase,  
 HeLa cells, C173  
 Intestinal epithelium, sodium-dependent  
 transport system,  $\alpha$ -methylglucoside  
 and (chicken), C227  
 Intestines, transport energetics,  $\alpha$ -  
 methylglucoside and (chicken), C227  
 Ion  
 content, cells, tracheal epithelium, C184  
 liquid exchanger, chloride ion-selective  
 microelectrodes, C258  
 transport, sodium-hydrogen exchanger,  
 kidney, C220  
 Iron, deficiency, skeletal muscle, C47  
 Isoforms, myosin heavy chain,  
 neurotrophic effects (chick), C269  
 Isometric contraction: *see* Muscle  
 Isoproterenol  
 eccrine sweat secretion, calcium and  
 (monkey), C113  
 gland changes, skin (frog), C250  
 ouabain-inhibited, hyperpolarization,  
 muscle, C145

## K

- Kidney  
 epithelia, transport properties (toad),  
 C154  
 microvillus membrane, ammonium and  
 lithium interaction, C220  
 Kidney cortex, microvillus membrane,  
 ammonium and lithium interaction,  
 C220  
 Kidney tubules, proximal, ammonium and  
 lithium interaction, C220

## L

- Lactate  
 glucose uptake and, exercise, skeletal  
 muscle, C200  
 muscle fiber fatigue, caffeine and (frog),  
 C160  
 Lactate dehydrogenase, enzyme release,  
 skeletal muscle (frog), C98  
 Lactation, epithelial cells, adipocytes,  
 metabolic cooperativity, C204  
 Lactic acid, iron deficiency effects, skeletal  
 muscle, C47  
 Leucine, transport activity, erythrocytes  
 (chicken), C233  
 Lipogenesis, adipocytes, epithelial cells  
 and, metabolic cooperativity, C204

- Lithium, ammonium and, sodium-hydrogen  
 exchanger, renal microvillus  
 membrane, C220  
 Liver cells: *see* Hepatocytes  
 Lysine, transport, erythrocytes (chicken),  
 C233

## M

- Macrophages, rectification, negative  
 resistance region, C9  
 Mammary gland, epithelial cells,  
 adipocytes, metabolic cooperativity,  
 C204  
 Maternity: *see* Fetus; Placenta; Pregnancy  
 Membrane  
 function, calcium deprivation effects,  
 hepatocytes, C3  
 potentials: *see* Potentials  
 sugar transport, sulfhydryl group,  
 erythrocytes (goose), C33  
 transport, enzymes, skeletal muscle  
 (frog), C98  
 Metabolic cooperativity, epithelial cells,  
 adipocytes and, C204  
 Metabolic rate, basal, thyroxine effects,  
 C134  
 Methacholine, eccrine sweat secretion,  
 calcium and (monkey), C113  
 $\alpha$ -Methylglucoside, sodium-dependent  
 transport system, intestinal  
 epithelium (chicken), C227  
 Microelectrodes  
 ion-selective, chloride, liquid ion  
 exchanger, C258  
 water-selective, mass spectrometry  
 (toad), C86  
 Mitochondria, brown fat, thyroxine effects,  
 C134  
 Mitochondrial enzymes, epinephrine  
 treatment effects, C55  
 Models, enzyme release, skeletal muscle  
 (frog), C98  
 Monensin, glucose-induced electrical  
 activity and, pancreatic  $\beta$ -cells, C264  
 Monolayer cultures, hepatocytes,  
 transmembrane potential, C209  
 Mucin, submandibular secretion, calcium  
 and adenosine monophosphate,  
 cyclic effects, C76  
 Muscle  
 fast-twitch red, cytochrome *c* and  
 myoglobin turnover, C140  
 fast-twitch white, cytochrome *c* and  
 myoglobin turnover, C140  
 insulin hyperpolarization, ouabain-  
 inhibitable process, C145  
 isometric contractin, caffeine and (frog),  
 C160  
 mechanical properties, tenotomy and  
 denervation, C150  
 stretch-induced growth, wing (chicken),  
 C93  
 Muscle, heart, chloride activity, ventricular  
 (mammal), C121  
 Muscle, papillary: *see* Muscle, heart  
 Muscle, skeletal  
 chloride activity, ventricular (mammal),  
 C121  
 depolarized, potassium ion flux ratio  
 (frog), C68  
 glucose uptake, exercise, C200  
 iron deficiency effects, C47  
 red, cytochrome *c* and myoglobin  
 turnover, C140  
 sarcoplasmic enzyme release (frog), C98

- Muscle, smooth  
 contraction, acetyl glyceryl ether  
 phosphorylcholine, ileum, C130  
 force-velocity relations, airway, C42  
 vascular, prostaglandin  $H_2$  analogue U-  
 44069, C243  
 Muscle fibers  
 fatigue, caffeine and (frog), C160  
 weak acid effects (barnacle), C193  
 Myofibrillar proliferation, stretch-induced  
 growth, wing muscles (chicken), C93  
 Myoglobin, turnover, red skeletal muscle,  
 C140  
 Myosin, heavy chain synthesis,  
 neurotrophic effects (chick), C269

## N

- Nerve: *see also* specific nerve and site  
 growth factor, heart, C215  
 N-Ethylmaleimide, action, sugar transport,  
 erythrocytes (goose), C33  
 New directions, C1

## O

- Oscillations, transmembrane potential,  
 hepatocytes, C209  
 Ouabain  
 insulin hyperpolarization, muscle, C145  
 ion content and, cells, tracheal  
 epithelium, C184  
 isoproterenol-induced changes, glands,  
 skin (frog), C250  
 sodium-potassium-ATPase turnover,  
 HeLa cells, C173  
 Oxygen  
 consumption, cells, tracheal epithelium,  
 C184  
 uptake, iron deficiency effects, skeletal  
 muscle, C47

## P

- Pancreatic  $\beta$ -cells  
 divalent cation effects, C59  
 electrical activity, glucose-induced, pH  
 and, C264  
 Pectoralis muscle, myosin heavy chain  
 isoforms, neurotrophic effects  
 (chick), C269  
 pH  
 glucose-induced electrical activity,  
 pancreatic  $\beta$ -cells, C264  
 regulation, weak acid effects, muscle  
 fibers (barnacle), C193  
 Phenylalanine, uptake, placenta, maternal  
 and fetal, C106  
 Phenylephrine, eccrine sweat secretion,  
 calcium and (monkey), C113  
 Phosphocreatine, muscle fiber fatigue,  
 caffeine and (frog), C160  
 Placenta: *see also* Fetus; Pregnancy  
 amino acid uptake, maternal and fetal,  
 C106  
 Platelets, activating factor, smooth muscle  
 contraction, ileum, C130  
 Potassium  
 channel, skeletal muscle (frog), C68  
 conductance, macrophages, C9  
 muscle content, insulin  
 hyperpolarization, C145  
 Potassium-chloride, contracture, muscle  
 fiber fatigue (frog), C160  
 Potassium ions, flux ratio, skeletal muscle  
 (frog), C68  
 Potential difference, electrical, insulin



hyperpolarization, muscle, C145  
 Potentials  
   action, pancreatic  $\beta$ -cell activity, C59  
   membrane, macrophages, C9  
   transmembrane, monolayer culture, hepatocytes, C209  
 Pregnancy: *see also* Fetus; Placenta  
   epithelial cells, adipocytes, metabolic cooperativity, C204  
 Propionate, pH regulation and, muscle fibers (barnacle), C193  
 Propranolol, isoproterenol-induced changes, glands, skin (frog), C250  
 Prostaglandin endoperoxide, mechanism of activation, aorta, C243  
 Prostaglandin H<sub>2</sub>, analogue U-44069, mechanism of activation, aorta, C243  
 Protein synthesis, insulin receptors and, serine effects, C167

## R

Receptors, insulin, protein synthesis and, serine effects, C167  
 Rectifier, inward, potassium ions, skeletal muscle (frog), C68  
 Red blood cells: *see* Erythrocytes  
 Resistance, negative region, macrophages, C9  
 Respiratory capacity, muscle, epinephrine treatment effects, C55  
 Respiratory enzymes, mitochondrial, iron deficiency effects, skeletal muscle, C47

## S

Salivary glands, submandibular mucin secretion, calcium and adenosine monophosphate, cyclic effects, C76  
 Sarcomere, length, myofibrillar splitting (chicken), C93  
 Sarcoplasmic enzymes, release, skeletal muscle (frog), C98

Sciatic nerve, extract, neurotrophic effects, myosin heavy chain synthesis (chick), C269

## Serine

  caffeine and (frog), C160  
   protein synthesis, insulin receptors and, C167  
 Serosal cells, membrane, transport inhibitors, intestinal (chicken), C227  
 Serous cells  
   stimulus-induced vacuolation  
     secretory glands, tracheal, C25  
     submucosal glands, tracheal, C25  
 Skin, gland changes, isoproterenol-induced changes, C250  
 Sodium, muscle content, insulin hyperpolarization, C145  
 Sodium-dependent transport system,  $\alpha$ -methylglucoside and, intestinal epithelium (chicken), C227  
 Sodium-hydrogen exchanger, ammonium and lithium interaction, microvillus membrane, renal, C220  
 Sodium-potassium-ATPase  
   activity, erythrocytes (chicken), C233  
   turnover and regulation, HeLa cells, C173  
 Spectrometry, mass, water flux measurement, transepithelial (toad), C86  
 Stimulus-secretion response, serous cells, tracheal secretory glands, C25

## Sodium-potassium-ATPase

  activity, erythrocytes (chicken), C233  
   turnover and regulation, HeLa cells, C173

Spectrometry, mass, water flux measurement, transepithelial (toad), C86

Stimulus-secretion response, serous cells, tracheal secretory glands, C25

## Sugar

  sodium-dependent transport system, intestinal epithelium (chicken), C227  
   transport, sulfhydryl groups, erythrocytes (goose), C33  
 Sulfhydryl groups, sugar transport, nucleated erythrocytes (goose), C33  
 Sweat gland, eccrine, secretion, calcium and (monkey), C113

## T

Taurine, uptake, placenta, maternal and

fetal, C106

Temperature, thyroxine effects, brown fat mitochondria, C134

Tenotomy, muscle properties and, C150

Tetanus, muscle fiber fatigue, caffeine and (frog), C160

Thermogenesis, nonshivering, brown fat, thyroxine effects, C134

Thyroxine, brown fat thermogenesis, guanosine diphosphate binding, C134

Tracheal epithelium, ion content, cells, C184

Trachealis muscle, mechanics and energetics of lengthening, C42

Tracheal secretory glands, stimulus-induced vacuolation, tracheal secretory glands, C25

Tracheal submucosal glands, vacuolation, serous cells, C18

Transmembrane potential: *see* Potentials  
 Transport: *see* specific subject and site

## U

Urinary bladder, water flux measurement, transepithelial, mass spectrometry (toad), C86

## V

## Vacuolation

  mechanisms  
     secretory glands, tracheal, C25  
     submucosal glands, tracheal, C18

## Vacuoles

  stimulus-induced  
     secretory glands, tracheal, C25  
     submucosal glands, tracheal, C18

## W

Water, flux measurement, transepithelial, mass spectrometry (toad), C86

Work: *see* Exercise



# Author Index to Volume 10

- Aronson, P. S., C220  
Ashmore, C. R., C93
- Bang, N. U., C3  
Bartley, J. C., C204  
Barzen, K. A., C76  
Basbaum, C. B., C184  
Baumgarten, C. M., C121, C258  
Beigelman, P. M., C59  
Berne, R. M., C91  
Bissell, M. J., C204  
Brown, E. B., C47  
Burke, D., C150
- Chase, D., C150  
Cook, J. S., C173
- Dasse, K. A., C150
- Eastwood, A. B., C98  
Eaton, B. M., C106  
Edmondson, J. W., C3  
Emerman, J. T., C204
- Fell, R. D., C47, C55  
Findlay, S. R., C130  
Fishman, A. P., C91  
Fozzard, H. A., C121
- Gallin, E. K., C9
- Hanahan, D. J., C130  
Handler, J. S., C154  
Hanks, B. S. R., C42  
Havaranis, A. S., C269  
Heywood, S. M., C269  
Hickson, R. C., C140  
Highland, E., C184  
Holloszy, J. O., C47, C55, C200  
Horowicz, P., C68
- Ivy, J. L., C200
- Jarrell, J. A., C86
- Kaye, M. P., C215  
Keifer, D. W., C193  
Kimmich, G. A., C227  
King, J. G., C86  
Kinsella, J. L., C220
- Lafferty, J. L., C76  
Lerner, J., C233  
Lichtenstein, L. M., C130  
Livengood, D. R., C9  
Loutzenhiser, R., C243
- McKay, R. H., C47  
McLane, J. A., C47  
Mills, J. W., C18, C86, C250  
Morgan, H. E., C1, C91
- Nassar-Gentina, V., C160
- Pace, C. S., C264  
Passonneau, J. V., C160  
Perkins, F. M., C154  
Pinckard, R. N., C130  
Pollack, L. R., C173
- Quinton, P. M., C18, C25  
Quissell, D. O., C76
- Randles, J., C227  
Rapoport, S. I., C160  
Ribalet, B., C59  
Rogus, E., C145  
Rosenkoetter, M. A., C140
- Sachs, G., C264  
Sato, F., C113  
Sato, K., C113  
Schworer, M. E., C33  
Senyk, O., C68  
Smagula, R. M., C233
- Somes, Ralph G., Jr., C233  
Spalding, B. C., C68  
Stephens, N. L., C42  
Strehlo, B. L., C215  
Suarez-Kurtz, G., C98  
Summers, P. J., C93  
Sundin, U., C134  
Swift, J. G., C68
- Tarvin, J. T., C264  
Tate, E. H., C173  
Terblanche, S. E., C55  
Thibault, M. C., C269  
Thompson, I. G., C250
- Ullrick, W. C., C150
- Van Breemen, C., C243
- Wells, D. J., C215  
Whitfield, C. F., C33  
Widdicombe, J. H., C184  
Winder, W. W., C47, C55  
Wondergem, R., C209
- Yudilevich, D. L., C106
- Zierler, K., C145



# American Journal of Physiology: Cell Physiology

VOLUME 10, July, September, November 1981

Editor: H. E. MORGAN

---

**Associate Editors:**

R. D. BERLIN  
J. S. COOK  
R. E. FELLOWS

J. S. HANDLER  
P. A. KNAUF  
M. J. KUSHMERICK

M. LIEBERMAN  
A. E. PEGG

---

**Editorial Board:**

W. ALMERS  
M. P. BLAUSTEIN  
J. J. BLUM  
M. M. CIVAN  
P. B. DUNHAM  
M. ENDO  
A. FABIATO  
F. FAY  
J. R. FLORINI  
G. N. GILL  
H. GREEN  
R. B. GUNN  
D. J. HARTSHORNE  
E. HEINZ  
S. M. HEYWOOD  
E. HOMSHER

U. HOPFER  
K. JACOBSON  
B. S. KATZENELLENBOGEN  
G. KIMMICH  
R. K. H. KINNE  
J. F. LAMB  
P. C. LARIS  
H. LECAR  
C. O. LEE  
J. E. LEVER  
L. J. MANDEL  
P. P. McCANN  
F. MOREL  
G. E. MORTIMORE  
R. A. MURPHY  
V. T. NACHMIAS

J. M. OLIVER  
J. C. PARKER  
H. PASSOW  
A. H. REDDI  
J. P. REEVES  
L. REUSS  
K. ROBINSON  
A. ROTHSTEIN  
E. ROZENGURT  
E. RUOSLAHTI  
F. SOLOMON  
A. H. TASHJIAN, JR.  
Z. WERB  
S. H. WHITE  
E. M. WRIGHT

---

***Publications Committee of  
the American Physiological  
Society***

H. E. MORGAN, *Chairman*  
R. M. BERNE  
L. E. FARHI

S. R. GEIGER  
*Publications Manager and  
Executive Editor*

B. B. RAUNER  
*Production Manager*

W. A. SONNENBERG  
*Business Manager*

M. P. ROYAL  
*Copy Editor*

---

*Published bimonthly by*  
THE AMERICAN PHYSIOLOGICAL SOCIETY  
9650 Rockville Pike, Bethesda, MD 20814

Copyright © 1981 by the American Physiological Society. Printed in the United States of America by Waverly Press, Inc., Baltimore, MD 21202. The code at the bottom of the first page of an article indicates the copyright owner's consent that copies of an article may be made beyond that permitted by sections 107 and 108 of the U.S. Copyright Law—unless the copies are for general distribution, for advertising, for creating new works, or for resale—provided the per-copy fee is paid through the Copyright Clearance Center, Inc., 21 Congress St., Salem, MA 01970.

## Guest Referee Editors

*The Publications Committee of the American Physiological Society gratefully acknowledges the services of the following guest referee editors who assisted the Editorial Board in the reviews of manuscripts.*

R. F. Abercrombie  
T. S. Acott  
K. Amsler  
N. Anderson  
G. D. Aurbach  
D. Babcock  
S. Banerjee  
M. Barany  
D. F. Bohr  
R. Bulger  
W. F. Boron  
O. A. Candia  
V. Castranova  
R. J. Connett  
D. L. Cook  
S. Crie  
A. F. Cutilletta  
E. E. Daniel  
D. DiBona

D. Diedrich  
G. Duncan  
D. C. Eaton  
R. S. Eisenberg  
M. B. Feinstein  
J. D. Fenstermacher  
G. D. Ford  
L. E. Ford  
D. Foster  
R. A. Frizzell  
G. Gauthier  
L. Goldman  
A. M. Gordon  
P. Gunther-Smith  
F. R. Hallett  
W. Halpern  
K. Hermesmyer  
J. O. Holloszy  
B. Horwitz

A. M. Katz  
W. G. L. Kerrick  
P. La Celle  
K. F. LaNoue  
C-K. Lo  
R. Macey  
L. Marshall  
A. Martonosi  
D. S. Misfeldt  
L. E. Moore  
R. T. Moxley, III  
J. Neely  
P. Nemeth  
H. Padykula  
R. J. Paul  
F. J. Pearce  
W. R. Redwood  
E. Rios  
R. Robinson

J. M. Russell  
A. Sastre  
J. A. Schafer  
M. F. Schneider  
A. Schwartz  
W. W. Sleator  
S. H. Snyder  
A. M. Thompson  
R. L. Veech  
J. L. Walker  
D. Warshaw  
M. Weisfeldt  
W. W. Wells  
J. R. Williamson  
R. Wodick  
J. D. Wood  
J. W. Woodbury  
R. Zak





# American Journal of Physiology: Cell Physiology

No. 1. JULY 1981

## EDITORIAL

New directions

*H. E. Morgan*

C1

---

Deleterious effects of calcium deprivation on freshly isolated hepatocytes

*J. W. Edmondson and N. U. Bang*

C3

Inward rectification in mouse macrophages: evidence for a negative resistance region

*E. K. Gallin and D. R. Livengood*

C9

Formation of stimulus-induced vacuoles in serous cells of tracheal submucosal glands

*J. W. Mills and P. M. Quinton*

C18

Possible mechanisms of stimulus-induced vacuolation in serous cells of tracheal secretory glands

*P. M. Quinton*

C25

Locus of *N*-ethylmaleimide action on sugar transport in nucleated erythrocytes

*C. F. Whitfield and M. E. Schworer*

C33

Mechanics and energetics of lengthening of active airway smooth muscle

*B. S. R. Hanks and N. L. Stephens*

C42

Physiological and biochemical effects of iron deficiency on rat skeletal muscle

*J. A. McLane, R. D. Fell, R. H. McKay, W. W. Winder, E. B. Brown, and J. O. Holloszy*

C47

Adaptive responses of rats to prolonged treatment with epinephrine

*R. D. Fell, S. E. Terblanche, W. W. Winder, and J. O. Holloszy*

C55

Effects of divalent cations on  $\beta$ -cell electrical activity

*B. Ribalet and P. M. Beigelman*

C59

Unidirectional flux ratio for potassium ions in depolarized frog skeletal muscle

*B. C. Spalding, O. Senyk, J. G. Swift, and P. Horowicz*

C68

Role of calcium and cAMP in the regulation of rat submandibular mucin secretion

*D. O. Quissell, K. A. Barzen, and J. L. Lafferty*

C76

---

## SPECIAL COMMUNICATIONS

A mass spectrometer to measure transepithelial unidirectional labeled water fluxes

*J. A. Jarrell, J. W. Mills, and J. G. King*

C86

---

## ANNOUNCEMENTS

C89

No. 2. SEPTEMBER 1981

## EDITORIAL

By the numbers . . .

*A. P. Fishman, R. M. Berne, and H. E. Morgan*

C91

---

Stretch-induced growth in chicken wing muscles: myofibrillar proliferation

*C. R. Ashmore and P. J. Summers*

C93

Release of sarcoplasmic enzymes from frog skeletal muscle

*G. Suarez-Kurtz and A. B. Eastwood*

C98

Uptake and asymmetric efflux of amino acids at maternal and fetal sides of placenta

*B. M. Eaton and D. L. Yudilevich*

C106

Role of calcium in cholinergic and adrenergic mechanisms of eccrine sweat secretion <i>K. Sato and F. Sato</i>	C113
Intracellular chloride activity in mammalian ventricular muscle <i>C. M. Baumgarten and H. A. Fozzard</i>	C121
Contraction of guinea pig ileal smooth muscle by acetyl glyceryl ether phosphorylcholine <i>S. R. Findlay, L. M. Lichtenstein, D. J. Hanahan, and R. N. Pinckard</i>	C130
GDP binding to rat brown fat mitochondria: effects of thyroxine at different ambient temperatures <i>U. Sundin</i>	C134
Separate turnover of cytochrome <i>c</i> and myoglobin in the red types of skeletal muscle <i>R. C. Hickson and M. A. Rosenkoetter</i>	C140
Insulin does not hyperpolarize rat muscle by means of a ouabain-inhibitable process <i>K. Zierler and E. Rogus</i>	C145
Mechanical properties of tenotomized and denervated-tenotomized muscles <i>K. A. Dasse, D. Chase, D. Burke, and W. C. Ulbrick</i>	C150
Transport properties of toad kidney epithelia in culture <i>F. M. Perkins and J. S. Handler</i>	C154
Fatigue and metabolism of frog muscle fibers during stimulation and in response to caffeine <i>V. Nassar-Gentina, J. V. Passonneau, and S. I. Rapoport</i>	C160

---

#### RAPID COMMUNICATIONS

Effects of serine on protein synthesis and insulin receptors <i>R. A. Galbraith and M. G. Buse</i>	C167
---	------

No. 3. NOVEMBER 1981

#### EDITORIAL REVIEW

Turnover and regulation of Na-K-ATPase in HeLa cells <i>L. R. Pollack, E. H. Tate, and J. S. Cook</i>	C173
--	------

---

Ion contents and other properties of isolated cells from dog tracheal epithelium <i>J. H. Widdicombe, C. B. Basbaum, and E. Highland</i>	C184
Effect of weak acids on pH regulation and anion transport in barnacle muscle fibers <i>D. W. Keifer</i>	C193
Persistent increase in glucose uptake by rat skeletal muscle following exercise <i>J. L. Ivy and J. O. Holloszy</i>	C200
Metabolic cooperativity between epithelial cells and adipocytes of mice <i>J. C. Bartley, J. T. Emerman, and M. J. Bissell</i>	C204
Transmembrane potential of rat hepatocytes in primary monolayer culture <i>R. Wondergem</i>	C209
Specific binding of nerve growth factor to normal and denervated canine heart <i>D. J. Wells, B. L. Strehlo, and M. P. Kaye</i>	C215
Interaction of $\text{NH}_4^+$ and $\text{L}^+$ with the renal microvillus membrane $\text{Na}^+-\text{H}^+$ exchanger <i>J. L. Kinsella and P. S. Aronson</i>	C220
$\alpha$ -Methylglucoside satisfies only $\text{Na}^+$ -dependent transport system of intestinal epithelium <i>G. A. Kimmich and J. Randles</i>	C227
Selective breeding of chickens for erythrocytes with high and low leucine transport activity <i>R. G. Simes, Jr., R. M. Smagula, and J. Lerner</i>	C233
Mechanism of activation of isolated rabbit aorta by $\text{PGH}_2$ analogue U-44069 <i>R. Loutzenhiser and C. van Breemen</i>	C243
Isoproterenol-induced current changes in glands of frog skin <i>I. G. Thompson and J. W. Mills</i>	C250

---

## RAPID COMMUNICATIONS

An improved liquid ion exchanger for chloride ion-selective microelectrodes <i>C. M. Baumgarten</i>	C258
Glucose-induced electrical activity in pancreatic $\beta$ -cell: modulation by pH <i>J. T. Tarvin, G. Sachs, and C. S. Pace</i>	C264
Trophic effect of a sciatic nerve extract on fast and slow myosin heavy chain synthesis <i>M. C. Thibault, A. S. Havaranis, and S. M. Heywood</i>	C269

---

<i>Subject Index to Volume 10</i>	C273
<i>Author Index to Volume 10</i>	C277



